Space Weather Forecast

Issued on Sunday, 18 August 2024 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1 Minor Storms remain possible early day 1 (18 Aug). Occasional Moderate-class flares expected, with a chance of Strong-class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with four Moderate-class flares observed, the largest from the most complex of the ten regions on the disc, located in the northwest quadrant. Despite its moderate size and limited recent activity, this region has a persistent mixed polarity spot and an atypical north-south orientation. Some growth of small spots has occurred on its northwest periphery, however some of its other surrounding spots, including some of those to the south, have decayed. Some recent growth has also be observed other regions, in the southwest, in the southeast, and also in the two sunspots in the northeast. A further notable region may also be rotating on the eastern limb, which was the source of a recent Moderate class flare.

A coronal mass ejection (CME) occurred from the north-disc, most likely from a release of matter from the Sun's corona due to a reconfiguration in its overall magnetic field. This is expected to pass north of Earth on day 4 (21 Aug), however a glancing influence cannot be completely ruled out. No other Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: The Strong-flare CME from 14 Aug arrived at 17/1330 UTC. Solar winds rose from background speeds, below 350km/s, to be slightly elevated at 430-480 km/s, with a period of notably dense solar wind also observed. Interplanetary Magnetic Field, was initially Weak, but rose sharply with the arrival to become Strong. This declined after 17/1645 UTC to vary erratically between Weak to Strong levels. The north-south component, was also weak until the CME arrival, then varied between being Strong southward and Strong northward. After 17/1705 UTC, the north-south component became mainly Weak, but also with a trend to mainly northward values. Geomagnetic activity was Quiet at first, but rose to G1 Minor to G2 Moderate storm 17/1500-2359. The interval 17/1500-1800 was reported at G3 Strong storm, but has subsequently been downgraded to G2.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no Solar Radiation Storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity expected with further occasional Moderate-class flares, and a chance of isolated Strong-class flares.

Solar Wind /Geomagnetic Activity: There are no Earth directed CMEs, however the CME off the north-disc on 17 Aug has a slight chance of giving a glancing arrival on day 4 (21 Aug). Otherwise ongoing CME effects, perhaps enhanced by some interaction from the far winds from a coronal hole, are possible early on day 1 (18 Aug) before easing later in the day. Solar winds then easing to background day 2 (19 Aug) onward. Mainly Quiet conditions expected, however there is a chance of Active to G1 Minor Storms from any ongoing CME influence early on day 1 (18 Aug).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy

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protons) is forecast to remain at background with no Solar Radiation Storms occurring. However, there is a slight chance of this rising in response to any notable flare activity, with a slight chance of reaching the S1 Minor Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	30	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	25	25	25	25

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	5	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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